Message

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Sent: 1/13/2017 4:11:36 PM
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Subject: Quantitative cancer risk assessment for occupational exposures to asphalt fumes
Attachments: Rhomberg LR etal - Quantitative cancer risk assessment - asphalt fumes- 2015.pdf

Good morning Margaret,

Attached Review Article is – FYI.

Quantitative cancer risk assessment for occupational exposures to asphalt fumes during built-up roofing asphalt (BURA) operations

Lorenz R. Rhomberg, David B. Mayfield, Julie E. Goodman, Eric L. Butler, Marc A. Nascarella & Daniel R. Williams To cite this article: Lorenz R. Rhomberg, David B. Mayfield, Julie E. Goodman, Eric L. Butler, Marc A. Nascarella & Daniel R. Williams (2015) Quantitative cancer risk assessment for occupational exposures to asphalt fumes during built-up roofing asphalt (BURA) operations, Critical Reviews in Toxicology, 45:10, 873-918, DOI: 10.3109/10408444.2015.1094450

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Quantitative cancer risk assessment for occupational exposures to asphalt fumes during built-up roofing asphalt (BURA) operations: Lorenz R. Rhomberg1 , David B. Mayfield2 , Julie E. Goodman1 , Eric L. Butler1 , Marc A. Nascarella1 & Daniel R. Williams1 1 Gradient, Cambridge, MA, USA and 2 Gradient, Seattle, WA, USA

ABSTRACT The International Agency for Research on Cancer qualitatively characterized occupational exposure to oxidized bitumen emissions during roofing as probably carcinogenic to humans (Group 2A). We examine chemistry, exposure, epidemiology and animal toxicity data to explore quantitative risks for roofing workers applying built-up roofing asphalt (BURA). Epidemiology studies do not consistently report elevated risks, and generally do not have sufficient exposure information or adequately control for confounders, precluding their use for dose–response analysis. Dermal carcinogenicity bioassays using mice report increased tumor incidence with single high doses. In order to quantify potential cancer risks, we develop time-to-tumor model methods [consistent with US Environmental Protection Agency (EPA) dose–response analysis and mixtures guidelines] using the dose–time–response shape of concurrent exposures to benzo[a]pyrene (B[a]P) as concurrent controls (which had several exposure levels) to infer presumed parallel dose–time–response curves for BURA-fume condensate. We compare EPA relative potency factor approaches, based on observed relative potency of BURA to B[a]P in similar experiments, and direct observation of the inferred BURA dose–time–response (scaled to humans) as means for characterizing a dermal unit risk factor. We apply similar approaches to limited data on asphalt-fume inhalation and respiratory cancers in rats.

We also develop a method for adjusting potency estimates for asphalts that vary in composition using measured fluorescence. Overall, the various methods indicate that cancer risks to roofers from both dermal and inhalation exposure to BURA are within a range typically deemed acceptable within regulatory frameworks. The approaches developed may be useful in assessing carcinogenic potency of other complex mixtures of polycyclic aromatic compounds.

Warm regards
Channa

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